2 half tone blocks required of (A)
chairs forming top half of plate
facing p. 14. Reduce right-hand
chair to 3½ inches longest measurement
& left-hand chair proportionately
Cut away background

Lascelles

Summarized by Col. Clements

5663

DISEASES BUREAU LIBRARY.

DISEASES BUREAU RECEIVED 14 JAN 1924

COMMONWEALTH OF AUSTRALIA

Department of Health

SERVICE PUBLICATION No. 26

Hygienic Aspects of Factories and Shops Acts

ISSUED BY

THE DIVISION OF INDUSTRIAL HYGIENE OF THE
COMMONWEALTH DEPARTMENT
OF HEALTH

UNDER THE AUTHORITY OF
THE MINISTER FOR HEALTH

By Authority:
Albert J. Mullett, Government Printer, Melbourne

C.11793.

22500313167

PREFACE.

The following publication is a brief summary of those portions of the various Australian Factories and Shops Acts which deal with the hygiene of industry.

Industry in the Commonwealth is expanding in every direction, and there can be no doubt that there is commencing a period of industrial development which renders it imperative that this important phase of the public health be surveyed without further delay.

It seems timely, therefore, to review the requirements and restrictions that are imposed upon industry to conserve the health and well-being of the industrial worker.

The legal provisions embodied in these Acts are not in keeping with the present state of our knowledge. The extended researches which have taken place in recent years, both in our own and in other countries, are not, as yet, reflected in our legislation. The comments embodied in this publication are based upon the investigations of the Health of Munition Workers Committee, the Medical Research Council, and the Industrial Fatigue Research Board, and similar bodies in Great Britain and elsewhere, and are confined to such matters as may be said to have progressed beyond the experimental stage and which can be accepted as genuine contributions to our knowledge. It is often stated that progress in public health depends on education rather than legislation. That is quite true; nevertheless, certain basic legislation is essential, not merely for disciplinary or punitive purposes but for the guidance and assistance of those at whom it is directed; also, be it noted, obsolete legislation is often a formidable obstacle to progress.

The Factories and Shops Acts should be a source to which industry could turn for specific instructions in correct procedure. In the field of hygiene they fall short of this ideal, and the industrial proprietor who seeks to comply with the spirit of the law must seek elsewhere for the method, with respect to such matters as ventilation and illumination. The Commonwealth Department of Health is endeavouring to formulate hygienic standards which will be of assistance to the States in effecting more definite regulations.

There are many wise provisions contained in these Acts, many admirable safeguards, which are not mentioned nor considered here, as the intent was rather to focus attention on those phases of the subject which are susceptible to improvement.

It is to be hoped that this publication will be received in the spirit in which it is offered—namely, that of constructive criticism.

J. H. L. CUMPSTON, M.D., D.P.H.,
Director-General of Health.

15th October, 1923.

WELLCOME INSTITUTE LIBRARY

Coll.	welMOmec
Coll.	pam
No.	WA 400
	1923
	A93h

Hygienic Aspects of Factories and Shops Acts.

ACCIDENTS.

There is no uniform system of collecting accident statistics in the Australian States. The Factories and Shops Acts require the reporting of fatal accidents, or those causing incapacity for more that 24 or 48 hours, to the factory inspector. The subject-matter of the report varies, and detailed reports of fatal accidents may be required if the Minister so directs.

It is obvious that in the interests of saving life and lessening the incidence of accidents, knowledge as to the number of accidents, the manner of their occurrence, the loss of life, and the loss of time from work is an essential. The railways, tramways, and other branches of the public service might well set the example for private industrial enterprises by reporting annually the fullest information as to accidents, either directly or through the Government Statists. At the present time it is impossible to compare the accident hazard of similar industries in different States, or in the same State.

At the Conference of Commonwealth and State officials on Industrial Hygiene held in Sydney in September, 1922, it was resolved that: "It is the opinion of this Conference that it is very desirable that there should be a collection of morbidity and accident statistics upon uniform lines, and that the Commonwealth Statistician be asked to draft a uniform scheme." The success of any scheme which the Commonwealth Statist may prepare will depend upon the co-operation of private as well as of Governmental employers. The Safety First movement, which has made such remarkable progress in America and in Great Britain, is based upon an accurate analysis of the causation of accidents. The process engaged in at the time of accident, and the age and sex of the injured person, as well as his familiarity with the process, the extent of injury and the amount of time lost from work, are all items essential to such an analysis. These facts, which must be compiled in a standardized manner, give us the economic as well as the humanitarian side of the question, and afford justification for the investment of capital in preventive safety work in any given instance. For insurance and for arbitration purposes it is also necessary that there be made available accident statistics of various industries, which can be vouched for by responsible Government authority. Until this is done, no concerted or organized attempt to lessen fatal and disabling accidents can be attempted, for any effort, undertaken in the absence of an accurate appreciation of all the factors involved, must be of a haphazard nature.

ADMINISTRATION.

The State Departments of Labour and Industry, through the medium of the Factories and Shops Acts, administer matters of hygiene, such as the ventilation and sanitation of working places ; they deal, in some instances, with infectious diseases, and are charged with the supervision of working children and young persons. They thus occupy an extremely important place in the public health scheme, and the manner in which these public health functions are administered, and the *personnel* intrusted with their execution, become a matter of grave concern.

Inspectors.

The Factories and Shop Acts depend for their enforcement on factory inspectors. In most European countries and in the industrial States in the United States, but particularly in Great Britain, factory inspection is recognised as a profession calling for high mental and educational attainments. In these countries it has long been realized that inspectors cannot adequately deal with questions involving ventilation, temperatures and humidity, illumination, machinery hazards, electric hazards, and similar responsibilities unless they have some training in these subjects. In Australia the importance of qualified inspectors is not recognised by law. No educational requirements other than a common school education are necessary for appointment. During years of service many inspectors acquire a high degree of efficiency in their work both by experience and study, but lacking technical training they must, as a class, be continually in the position of having to deal with extremely technical subjects by rule-of-thumb methods. Chief factory inspectors and departmental heads recognise this, and in at least one State, efforts are being made to raise the qualifications for factory inspectors and also to provide courses of instruction for the present staff. (See Appendix A.)

Medical Inspectors.

There is not, in any of the State Departments of Labour and Industry, a staff medical officer. In Western Australia, however, the factory inspection department is part of the State Department of Health. The Factories and Shops Acts, in referring to infectious diseases and the supervision of working children, imply duties that could not properly be performed by persons without medical training. In all the leading countries of the world the importance of medical factory inspectors has been recognised, especially in questions relating to women and children. The appointment of medical factory inspectors in Great Britain has made possible the noteworthy results accomplished in the reporting of occupational diseases and in the control of specific hazards.

That important official, the certifying surgeon, is mentioned in the Acts of only two States (Victoria and South Australia), and the scope of his duties is restricted to granting medical certificates of fitness for work to young persons. (Appendix B.)

Children and Young Persons.

In all the States there are numerous regulations dealing with restrictions governing the employment of children and young persons. There is, however, a lack of uniformity that might well be adjusted. The minimum age limit is 14, except in Queensland where it is 13, and in Victoria and Western Australia the age for females is 15. For a list of the restricted occupations, both male and female, the reader is referred to the table in Appendix C. Medical certificates are required in certain industries for young persons under 16, but the certificate of any practitioner is accepted and the status of medical certification is generally unsatisfactory (see "Certifying Surgeon"). It is noteworthy, too, that Victoria exempts employees under 16 from medical certification in factories in which power (steam, water, gas, oil, electricity) is used only to drive sewing machines or in factories in which dresses, mantles, clothing, white work, underclothing, shirts, or boots and shoes are prepared or manufactured. The whole development of legislation in civilized countries dealing with the employment of children and young persons is along the lines of recognition of the necessity for safeguarding the health and well-being of adolescents—future citizens—during the most important years of their lives. Considerable progress has been made in the provision of educational facilities for employed young people, but practically nothing in the way of supervising or safeguarding their health. No system can be said to be satisfactory, or to discharge its responsibilities in a suitable manner, which does not provide for the physical examination of any person under 18, on commencing employment, by an official medical examiner who shall have a fair idea of the nature of the employment contemplated. This is so obviously in the best interests of the young person, of the industry, and of the community, that it is difficult to comprehend, in this generation, that such provision should be entirely lacking. Not only is it essential to know that a child is fit for employment, but there must also be recognised the necessity of assurance that during his (or her) growing years—the age of adolescence—the young person is progressing in a satisfactory manner towards healthy citizenship. For this assurance a yearly physical re-examination by the certifying surgeon is essential—not an unreasonable amount of interest to expect from the State towards the future citizen and wage earner. It is not only a question of the effects of employment. Home conditions, intercurrent disease, or other cause may unfit the young person for labour for which he has previously been certified.

Women.

Women are prohibited from a number of occupations, but these restrictions frequently date back a number of years and need revision in the light of recent industrial development. There is a considerable divergence in the restrictions, as between States, which should be adjusted. If a certain process is unfit for women in one State, it is unfit in the others. The lead processes particularly need to be investigated from the viewpoint of female labour, and uniform and equitable restrictions be based thereon. Only two States (New South Wales and Western Australia) recognise the advantage of making provision for the female worker before or after childbirth. (See Appendix D.)

Hours.

The Factories and Shops Acts cover hours very fully. Overtime is limited, both as to the amount permissible in any one day, in any one week, and yearly. Night work for females and young persons is prohibited, except in emergencies. Sunday work is prohibited, and the length of time (usually 5 hours) that may elapse without a meal for the employee is stated.

The hour schedules are too complex for further analysis here, but in the main, in so far as they pertain to health and guarding against fatigue, they would appear to attain their object.

The practice of the five-day week, increasing the daily hours and giving a complete freedom from work for two days a week, would seem, from a hygienic viewpoint, to be sound. As this custom is particularly noticeable in establishments employing women there is reason for presuming that it acts as a protection against undue (pathological) fatigue.

Hygiene of Working Conditions.

VENTILATION, HEAT, HUMIDITY, TEMPERATURE.

All the States prescribe a minimum cubic air space per employee and the square surface of inlet and outlet vents. New South Wales sets forth ventilation standards with wet and dry bulb thermometer limits, and in certain cases fixes the maximum amount of CO_2 permissible. The other States content themselves with general statements—"Proper and adequate ventilation," "Proper construction for ventilation," &c. Five States have special regulations for wet spinning. Even in the New South Wales regulations the most important factor in ventilation—movement of air—is not recognised.

The researches of Leonard Hill in Great Britain and of the New York State Commission on Ventilation in the United States, have emphasized how erroneous are many of the prevailing impressions on ventilation, and how necessary it has become to completely revise ventilation requirements for factories and shops. It is no fault of the Australian Factories and Shops Acts that they antedate our present knowledge of ventilation problems, but there is indicated a need for bringing these Acts into conformity with scientifically proved facts and modern ventilation experience. In the light of these it should be possible to set forth definite minimum standards for ventilation which will enable the factories and shops proprietors to secure adequate ventilation with the least possible trouble or expense. Mechanical ventilating systems, for instance, are usually costly and often disappointing, and they fail mostly because they are not constructed to produce definite atmospheric conditions. (See Appendix E.)

DANGEROUS TRADES AND DUST GENERATING.

Three States make provision for the regulation of dangerous trades. Victoria has special regulations of a comprehensive nature, dealing with the manufacture of white lead, red lead, and litharge, for various wood-working processes and for white and yellow phosphorus. All the States refer in general and indefinite terms to dusty processes, and provide for the installation of mechanical means for dust prevention, when the same appears advisable to the inspector.

The dust hazards are recognised as being of the greatest importance, and the estimation of the harmful properties of any given dust (and they differ widely according to their composition) and of the amount present in the air is not only feasible but necessary if they are to be dealt with, and at the same time avoid needless expense. As with ventilating systems, mechanical dust exhaust systems often fall far short of the claims made for them, and at the same time they give a sense of false security. Insurance statistics amply prove the relationship between dusty trades and pulmonary diseases. Prevention lies along the lines of dust sampling, determining both the nature and constituents of the dust and the amount present. With these facts for a guide it is possible to recommend the installation of dust exhaust systems, the use of respirators by employees, sprinkling with water, or any combination of these methods which may be indicated. The most dangerous dusts are imperceptible to the unaided eye, and only sampling by approved scientific methods can determine the hazard. In this connexion, too, it may be pointed out that no States make provision for the protection of the eyes of industrial workers by requiring employers to provide, and employees to wear, suitable goggles in grinding, chipping, riveting, and other processes having distinct eye hazards.

ILLUMINATION.

Only one State (New South Wales) prescribes a fixed illumination value, and that to a very limited extent. The progress that has been made in recent years in the manufacture of various types of electric light has brought factory and shop illumination to a fine art and has made possible the formulation of very precise illumination codes. There is no branch of industrial hygiene in which economy, efficiency, and health protection can be more nicely balanced than is the case with illumination. Proper lighting in factory work is not so much a question of increased consumption of current, as of placement and spacing of lights so that a proper light value is obtained at the working point. The foot-candle is the unit of measure in England and the United States. The measurement of the amount of light present in any given place is very simple, and should be a routine duty of factory inspectors. The requisite degree of illumination for various types of work and processes has been carefully worked out by engineering associations. The adoption of illumination codes by State Departments of Labour and Industry is essential if proper lighting conditions are to be obtained. (See Appendix F.)

Sanitation.

WASHING, SANITARY, EATING, SEATING FACILITIES.

With one exception all the States make ample provision for washing and sanitary accommodations, on a fixed scale, directly proportionate to the number of employees. This is the only satisfactory method of dealing with such subjects by legal enactment, and might well be imitated in the other hygienic requirements. All the States fail in the matter of seating and rest rooms. While it is true that several make provision for seats in shops and factories, there is no recognition of the hygienic importance of proper seating devices, especially for women operatives on sewing machines and other factory processes. Boxes, stools, backless chairs, benches and a variety of makeshift devices are all too frequently seen on visiting industrial establishments. There will be little improvement until the State authorities are prepared to offer designs or models of work-chairs, properly made and suited in size to the worker. (See Appendix G.). Rest rooms also receive an entirely inadequate recognition, yet their importance in establishments, particularly where women are employed, is universally appreciated. A factory employing women, without a rest room, is an anachronism. It is just as essential for Factories and Shops Acts to specify the size and accommodation of rest rooms and the use of proper chairs as it is to specify the number of lavatory basins.

Dressing-rooms also are not sufficiently provided for, and it is noteworthy that the Acts make provision for seating and rest and dressing-room facilities only for females.

CONCLUSION.

The foregoing is by no means a comprehensive or exhaustive digest of the Factories and Shops Acts, but is restricted to the subjects which from a public health stand-point are most readily recognisable as deficient, yet which are of first degree importance, and in which the present status of our knowledge justifies the attempt to make improvements. It is a matter that calls for the concerted action of the State authorities concerned, and in the furtherance of such action the Commonwealth Department of Health is prepared to furnish research and information.

APPENDIX A.

REQUIREMENTS FOR FACTORY INSPECTORS IN OTHER COUNTRIES.

(Compiled through the courtesy of the International Labour Office in Geneva and the National Industrial Conference Board, New York).

GREAT BRITAIN : The Factory Inspectors, both men and women, are recruited by means of a competitive examination limited to candidates who have obtained a nomination from the Secretary of State on the recommendation of a Selection Committee. As regards men, it is laid down that while the candidate's educational qualifications as well as the character of his employment will be considered, preference as a rule will be given to those who have had a scientific education, and have also had either practical experience in factories, engineering works, &c., or other experience which is likely to be useful to a factory inspector. The educational standard expected is an honours degree at a recognised University or the equivalent. In exceptional cases a candidate who had not had the advantage of a good early education might be admitted on the strength of his industrial experience, but such a candidate would not find it easy to compete at the examination.

As regards the women, candidates were subjected to a preliminary scrutiny by a Committee of Selection, but no definite directions were laid down as to the principles on which they were to be selected. A high educational standard has, however, been most invariably insisted on. The subjects for the examination are the same as in the case of the men, except that physiology and bacteriology are substituted for the mechanical subjects.

The scheme of the examination for men, which will probably undergo some revision, is the following :—

A.—Obligatory Subjects.

1. English Composition.
2. Arithmetic.

B.—Optional Subjects.

3. Chemistry.
4. Physics (including Mechanics).
5. Practical Mechanism and Industrial Machinery.
6. Electricity.
7. Industrial Methods and Management.
8. Economics, including knowledge of the history of industry in modern times.
9. Mathematics.
10. French *or* German *or* Italian.
11. English Literature.
12. English History.

Note.—Four only of the optional subjects may be offered. Any candidate who does not satisfy the Civil Service Commissioners in three of them will be thereby disqualified.

The appointments of both men and women are subject to a probationary period of two years and cannot be confirmed until the candidates have passed a qualifying examination, in Factory Law and Sanitary Science. The object of deferring the examination in these subjects is to test the practical knowledge acquired by the Inspectors in the course of their duties.

The above remarks do not apply to the special medical, electrical and engineering staffs, which are recruited by selection only.

On their appointment, Inspectors are given a careful training in their work by the senior members of the staff under whom they work.

FRANCE.—Divisional inspectors and men and women departmental inspectors—latter are appointed on results of competitive examinations.

Syllabus : Written examination 1.—Essay on labour legislation, administrative and penal law—3 hours.
2.—Essay on industrial hygiene—2 hours.
3.—Essay on mechanics, electricity, accident prevention—2 hours.

Oral examination 1.—Legislation applied by labour inspectors.
2.—Elements of administrative and penal law.
3.—Knowledge of labour and industrial legislation.
4.—Elements of industrial hygiene.
5.—Elements of mechanics and electricity—accident prevention.
6.—Practical test in industrial hygiene
7.—Practical test in mechanics, electricity, and accident prevention
} Making use of actual machinery
8.—Voluntary test in practical industrial work, for candidates who have had 10 years as manager, engineer worker or apprentice in factories with machinery.

APPENDIX A—*continued.*

Candidates who pass are appointed as departmental inspectors on probation, 1 year. Promotion takes place after 3 years in lower grade, according to place on list for promotion. Divisional inspectors are nominated from departmental inspectors.

GERMANY : *Prussia.*—Special career. Qualifications required are a good general education—(12 years of primary and secondary school) 4 years' study of engineering or chemistry at a technical high school followed by examination *one*, then 1 year in industrial shop, and 1½ years in office of factory inspector. After this 3 terms at University, studying labour legislation and administrative law, followed by examination *two*. Assistants may be women workers presented by labour organizations, with no special training. Physicians also employed with special duties. *Saxony.*—similar, but labour leaders may become inspectors without technical high school training. Assistants have good technical training without having gone through high school.

UNITED STATES OF AMERICA : *California.*—Requires safety engineers and inspectors on the staff of the industrial accident commissions to take civil service examinations. The men are specially qualified in the work which they are to do. The work is divided into the inspection of mining, boilers, mechanical appliances, electrical appliances, construction, ship-building and elevators. The inspectors are specially qualified, although they are not all university graduates, but those without university education have acquired technical training in other ways. Applicants for examinations submit full details of their experience and knowledge of the particular division where they seek employment. Reference is also required and letters describing the capabilities of each applicant. In addition, each man's history is carefully checked. They are submitted to written and oral examinations and the civil service commission calls in experts to assist in the examinations of each branch. So that, on the examining boards all the specialities examined in are represented outside of the State service.

Maryland.—Factory inspectors are designated as industrial inspectors under the classified civil service. These inspectors start at 1,200 dollars to 1 500 dollars per year, and have the following qualifications :—Education equivalent to that representing their graduation from high school, preferably additional sociological training, successful inspecting or investigating experience, familiarity with child and female labour regulations, ability to prepare concise reports, knowledge of industrial safety and sanitation, ability to judge situations and persons accurately and quickly, keenness of perception, integrity, resourcefulness, perseverance, good address and tact.

The duties of such inspectors are :—To inspect places where women or children are working and otherwise to assist in the enforcement of the child labour, eight-hour and other laws regulating industrial conditions, to prepare reports and to make recommendations and to perform relative work as required. Applicants must be at least 18 years of age on the date of the examination.

Massachusetts.—Factory inspectors are chosen under civil service regulations. The examinations are thorough ones and are based almost wholly upon problems in connexion with the work of the Department. They deal with the usual matters pertaining to sanitation, ventilation, experience in safeguarding machinery, accident prevention work, occupational diseases and other laws in general. Some of the inspectors are University graduates, and of the Institute of Technology, while there are two physicians regularly employed at inspection work. Massachusetts has 36 inspectors, six of whom are women, and of the 36, four investigate building operations and two are retained for special work. All inspectors have had training in some industry, and so they are familiar with problems in the textile trade, printing industry, shoe business and machine-shop experience as well as in other lines of manufacture.

Minnesota.—No person shall be eligible to appointment as a Chief Factory Inspector, Elevator Inspector, Railroad Inspector, or Factory Inspector in the Department of Labour who is not possessed of practical experience and knowledge in, and of the operation of, such machinery, appliances, and work places as he may be called upon to inspect. All applicants must undergo a competitive examination before the Civil Service Board of Examiners. The nature of the examination is such that they are examined in both practical and technical subjects. Not only is this true in their written examinations but they are subjected to an oral examination compiled wholly of practical questions put to them by the Board of Examiners.

New Jersey.—The factory inspectors are under Civil Service Law and must pass an examination before appointment. The examination covers elementary subjects, such as arithmetic, and information on engineering matters in connexion with dust removal, sanitary requirements, machine-guarding practice, structural matters and fire prevention. They must also possess a knowledge of the various laws enforced by the Department of Labour. Several of the factory inspectors are university graduates. The compensation varies from 1,440 dollars to a maximum of 2,360 dallars, although this maximum can be increased at any time at the discretion of the Civil Service Commissioner.

APPENDIX A—*continued.*

New York—Inspectors are appointed after having passed a successful physical examination. The nature of the examination is to test their qualifications to apply the provisions of the labour law and the industrial code. This requires practical mechanical experience and a thorough knowledge of conditions existing in industrial plants. Many inspectors have technical qualifications also.

Pennsylvania—Has four grades of inspectors, all inspectors of the fourth grade being technical men. There are 58 inspectors in the four grades, 50 being in the first grade, 2 in the second and third each, and 4 in the fourth grade. Second grade inspectors shall be supervising inspectors, third grade inspectors shall be physicians, one of them a woman; of the four inspectors of the fourth grade one shall be a physician, one a mechanical engineer expert in ventilation and accident prevention, one a chemical engineer, and one a civil engineer expert in fire prevention and building construction.

APPENDIX B.

INFECTIOUS DISEASES AND MEDICAL CERTIFICATION.

VICTORIA.—Certifying surgeons may grant working certificates to children.

NEW SOUTH WALES.—Factories or shops where wearing material is made, cleaned, or repaired are restrained where there is a case of infectious disease.

QUEENSLAND.—An inspector who believes an employee is suffering from bodily infirmity or infectious disease may cause him to be laid off.

SOUTH AUSTRALIA.—Certifying surgeons may grant working certificates to children.

WESTERN AUSTRALIA.—Inspector shall report to Health Department any person whom he believes to be infectious in handling food stuffs, and shall lay said person off. Applies to factories and shops and warehouses. Unlawful to manufacture or work up goods or materials in the presence of infectious disease.

TASMANIA.—

DUTIES OF CERTIFYING SURGEONS UNDER FACTORIES AND SHOPS ACTS OF GREAT BRITAIN.

(*a*) To examine young persons under 16 years of age and children for certificates of sickness for employment in factories and workshops at the request of the occupier, and to grant certificates in suitable cases.

(*b*) To investigate and report upon certain accidents and certain cases of poisoning.

(*c*) To examine and certify persons employed in certain dangerous processes when so required whether in pursuance of regulations or special rules or otherwise.

(*d*) To make special inquiries, examinations and reports when so required by the Secretary of State.

(*e*) To attend in court and give evidence in cases under the Acts when so required by any of H.M. Inspectors of Factories.

(*f*) To furnish an annual report and an annual account.

(*g*) To perform the duties required from the certifying surgeon by the *Workmen's Compensation Act* 1906, with regard to certain industrial diseases. (Quoted from Hope, Hanna, and Sallybrass.)

APPENDIX C.

CHILDREN AND YOUNG PERSONS.

REQUIREMENTS FOR EMPLOYMENT.

VICTORIA.—Age limit 14 males, 15 females. Under 16, medical certificate *may be* required in certain industries.

NEW SOUTH WALES.—Age limit 14. Under 16, medical certificate required in certain industries. Inspector may require medical certificate.

QUEENSLAND.—Age limit 13. Under 16, medical certificate *may be* required in certain industries. Inspector may require medical certificate.

SOUTH AUSTRALIA.—Age limit 14. Under 16, medical certificate *may be* required in certain industries.

WESTERN AUSTRALIA.—Age limit, 14 males, 15 females. Under 16, medical certificate *may be* required in certain industries.

TASMANIA.—Age limit 14. Under 16, medical certificate *may be* required in certain industries.

APPENDIX C—*continued.*

RESTRICTED OCCUPATIONS (MALE).

VICTORIA.—Under 16, dry grinding, lucifer matches, type setting (conditional). Under 18, white lead, mirrors, cleaning moving machinery, lifts, wet spinning (conditional).

NEW SOUTH WALES.—Under 16, glass annealing, dry grinding, lucifer matches, lead casting in printing, lifts. Under 18, white lead, mirrors.

QUEENSLAND.—Under 18, white lead, lead headed nails, dry grinding, glass annealing, mirrors, bronzing.

SOUTH AUSTRALIA.—Under 14, fustian cutting, grinding, glass annealing. Under 16, dry grinding, lucifer matches. Under 18, white lead, mirrors.

WESTERN AUSTRALIA.—Under 16, lucifer matches. Under 18, white lead, mirrors, lifts, cleaning moving machinery.

TASMANIA.—Under 16, dry grinding, lucifer matches. Under 18, white lead, mirrors, lead glazing.

RESTRICTED OCCUPATIONS (FEMALE).

VICTORIA.—Under 16, bricks, tiles, salt, dry grinding, lucifer matches. Under 18, white lead, mirrors, glass annealing, lifts, type setting (conditional), 25 lbs. weight.

NEW SOUTH WALES.—Under 16, dry grinding, lucifer matches, lead casting in printing. Under 18, white lead, mirrors, glass annealing, bricks, tiles, salt, cleaning moving machinery, boilers.

QUEENSLAND.—

SOUTH AUSTRALIA.—Under 14, fustian cutting, grinding. Under 16, bricks, tiles, salt, dry grinding, lucifer matches, moving machinery. Under 18, white lead, mirrors, annealing glass, lifts. Under 20, 25 lbs. weight.

WESTERN AUSTRALIA.—Under 16, bricks, tiles, salt, lucifer matches, typesetting. Under 18, glass, lifts.

TASMANIA.—Under 16, bricks, tiles, salt, dry grinding, lucifer matches, laundry. Under 18, glass.

APPENDIX D.

RESTRICTIONS OF EMPLOYMENT FOR FEMALES.

VICTORIA.—Wet spinning (conditional). Cleaning moving machinery.

NEW SOUTH WALES.—For 4 weeks *after* confinement. Lifts. Cleaning moving machinery.

QUEENSLAND.—White lead, lead headed nails, dry grinding, glass annealing, mirrors, bronzing.

SOUTH AUSTRALIA.—Lifts, cleaning moving machinery.

WESTERN AUSTRALIA.—For 6 weeks *before* and *after* confinement. Whitelead, mirrors, cleaning moving machinery.

TASMANIA.—White lead, lead glazing, mirrors, offensive trades (except soap and candles).

APPENDIX E.

VENTILATION, HEAT, HUMIDITY, AND TEMPERATURE REQUIREMENTS.

VICTORIA—Prescribes 400 cubic feet air space per employee, and 12 square inch inlet and 12 square inch outlet for air vent per employee. Premises to be properly warmed, all devices to have flues, except electric. Wet spinning limited.

NEW SOUTH WALES—Prescribes 400 cubic feet air space per employee, and 12 square inch outlet and 12 square inch inlet for air vent per employee. Proper construction for coolness and air circulation, natural ventilation to be used where practicable. Four changes of air per hour with artificial ventilation, CO_2 limited, and wet and dry bulb thermometer limits prescribed. Special rules for wet spinning. Proper heating required and devices to have flues, unless electric.

QUEENSLAND—Prescribes 400 cubic feet air space per employee. 12 square inch inlet and 12 square inch outlet vent per employee. Wet spinning, special regulations. Proper heating, heating devices to have flues, except electric. Proper construction for coolness and air circulation. Tailors' and dressmakers' irons special regulations. Temperature limited by that of outside air.

APPENDIX E—*continued.*

SOUTH AUSTRALIA—Prescribes 400 cubic feet air space per employee, and 12 square inch outlet and 12 square inch inlet air vents per employee. Heating devices to have flues. Wet spinning, special regulations.

WESTERN AUSTRALIA—Prescribes 350 cubic feet air space per employee and 12 square inch inlet and 12 square inch outlet air vents per employee. Heating devices to have flues. Tailors, and dressmakers' irons to be properly ventilated. Proper construction for coolness.

TASMANIA—Prescribes 400 cubic feet air space per employee, and 12 square inch outlet and 12 square inch inlet air vents per employee. Heating devices to have flues. Wet spinning, special regulations.

APPENDIX F.

The following illumination code was prepared by the divisional committee of the Council of National Defence (U.S.A.). It is approved by the Illuminating Engineering Society. It is the basis of the lighting code of the States of Pennsylvania and New Jersey. (Quoted from U.S. Public Health Reports, 24th January, 1919.)

"*Advantages of good light.*—While the necessity of good light is so evident that a list of its effects may seem commonplace, these same effects are of the greatest importance in their relation to factory and mill management. The effects of good light, both natural and artificial, and of bright and cheerful interior surroundings include the following :—

1. Reduction of accidents.
2. Greater accuracy in workmanship.
3. Decreased spoilage of product.
4. Increased production for the same labour cost.
5. Less eye strain.
6. Better working and living conditions.
7. Greater contentment of the workmen.
8. Better order, cleanliness, and neatness in the plant.
9. Easier supervision of the men.

In this list it will be noted that items 5, 6, 7, 8, and 9 all have a bearing on accident prevention.

The following code gives in the briefest possible form the essentials of proper and adequate lighting for factories, mills, and other work places :—

Rule 1.—*General requirement.*—Working or traversed spaces in buildings or grounds shall be supplied during the time of use with artificial light in accordance with the following rules when natural light is less than the intensities specified in rule 2.

Rule 2.—*Intensity required.*—The desirable illumination to be provided and the minimum to be maintained are given in the following table :—

	Foot candles* at the work.	
	Ordinary practice.	Minimum.
(*a*) Roadways and yard thoroughfares	0.05–0.25	0.02
(*b*) Storage spaces	.50–1.00	.25
(*c*) Stairways, passageways, aisles	.75–2.00	.25
(*d*) Rough manufacturing, such as rough machining, rough assembling, rough bench work	2.00–4.00	1.25
(*e*) Rough manufacturing, involving closer discrimination of detail	3.00–6.00	2.00
(*f*) Fine manufacturing, such as fine lathe work, pattern and tool-making, light-coloured textiles	4.00–8.00	3.00
(*g*) Special cases of fine work, such as watchmaking, engraving, drafting, dark-coloured textiles	10.00–15.00	5.00
(*h*) Office work, such as accounting, type-writing, &c. ..	4.00–8.00	3.00

---

* The foot-candle, the common unit of illumination, is the lighting effect produced upon an object by a standard candle at a distance of 1 foot ; at 2 feet the effect would be not one-half foot-candle, but one-fourth foot-candle, &c. A lamp which would give off 16 candle-power uniformly in all directions would produce a uniform illumination of 1 foot-candle at a distance of 4 feet in any direction.

Note.—Measurements of illumination are to be made at the work with a properly standardized portable photometer.

Rule 3.—*Shading of Lamps.*—Lamps shall be suitably shaded to minimize glare.

Note.—Glare, either from lamps or from unduly bright reflecting surfaces, produces eye strain and increases accident hazard.

Rule 4.—*Distribution of light on work.*—Lamps shall be so installed in regard to height, spacing reflectors, or other accessories as to secure a good distribution of light on the work, avoiding objectionable shadows and sharp contrasts of intensity.

Rule 5.—*Emergency lighting.*—Emergency lamps shall be provided in all work-space aisles, stairways, passageways, and exits, to provide for reliable operation when, through accident or other cause, the regular lighting is extinguished. Such lamps shall be in operation concurrently with the regular lighting and independent thereof.

Rule 6.—*Switching and controlling apparatus.*—Switching or controlling apparatus shall be so placed that at least pilot or night lights may be turned on at the main points of entrance."

APPENDIX G.

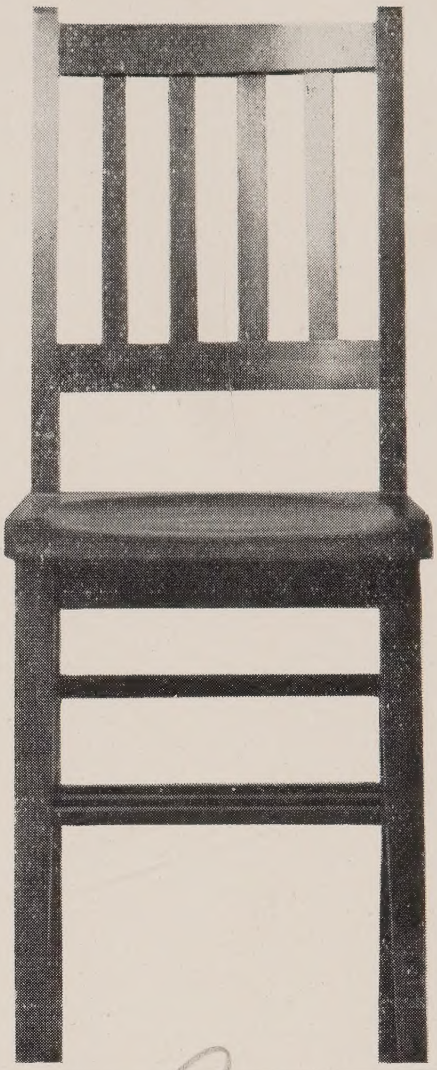
The following illustrations of a work chair are from photographs of the standard work chair, specimens of which were made for the Commonwealth Department of Health.

For the great majority of industrial purposes the solidly-built chair is more useful than the adjustable one; it is cheaper to make, and stronger.

This chair is taken from the model chair devised by a committee, of which Dr. Joel E. Goldthwait, an Orthopaedic Surgeon, of Boston, was the Chairman, and described in the *Journal of Industrial Hygiene* for September, 1921, in an article by Emmons and Goldthwait.

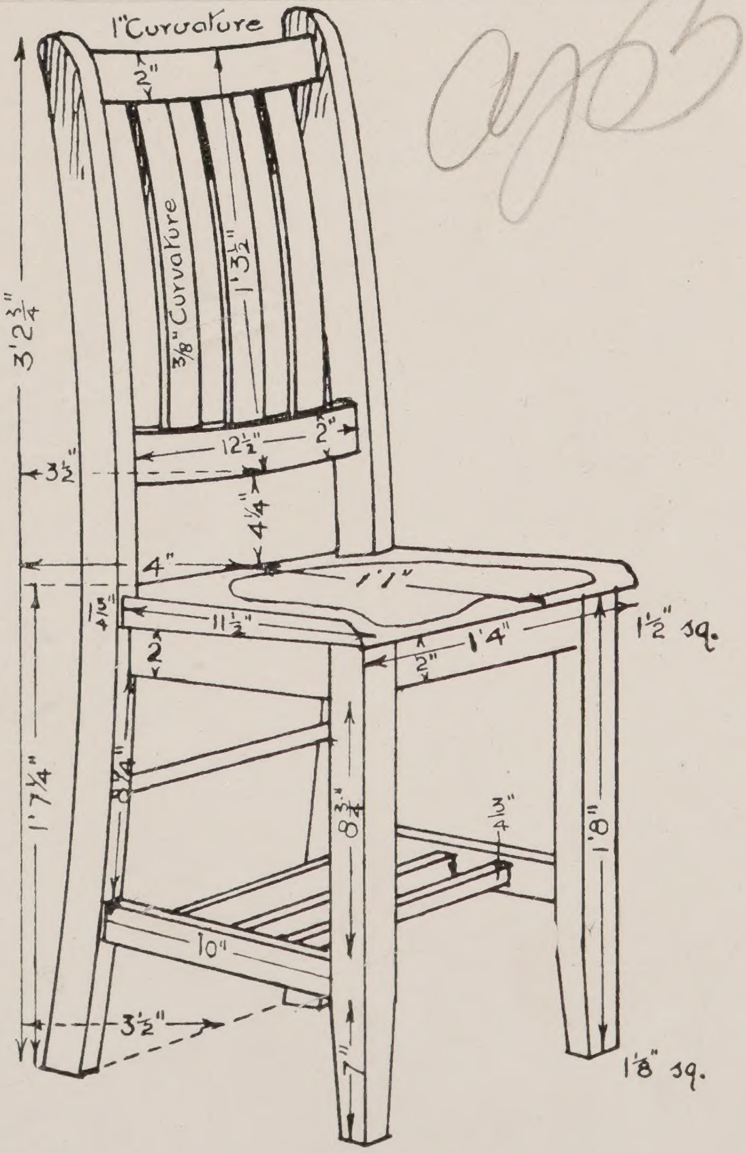
The chair is made in four sizes—17 inches, 18 inches, 19 inches, and 20 inches—and will satisfy the needs of most factory and workshop requirements. It maintains the body in a hygienic and restful posture, supports the back, and is firm and comfortable.

At times the use of a foot-rest may be advisable. The reader is also referred to Welfare Pamphlet No. 6, entitled "Seats for Workers in Factories and Workshops," issued by the Home Office in 1920.



Reduce to 3½ inches along this line, or reduce other figure proportionately.

AJB



By Authority: Albert J. Mullett, Government Printer, Melbourne.